AMENDMENTS TO CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in this application.

Listing of Claims:

1. (Currently Amended) An Ethernet industrial control system for transferring a plurality of messages, wherein the messages are tagged with identifiers of varying levels of priority, ranging from a highest priority to a lowest priority, the system comprising:

a serial network bus; ~~and~~

means for placing the message onto the bus, wherein a message having a higher priority identifier is placed onto the bus before placing a message with a lesser priority identifier onto the serial network bus;

a slave device communicatively coupled to the bus; and,

a clock synchronization message for the slave device is tagged with the highest priority identifier.

2. (Original) The system of claim 1, wherein the levels of priority adhere to IEEE802 standards.

3. (Original) The system of claim 1, wherein the message placing means is a fast communication, reduced UDP-IP stack.

4. (Original) The system of claim 3, wherein the fast communication, reduced UDP-IP stack is dedicated for time critical flow.

5. (Original) The system of claim 4, including a plurality of communication stacks, wherein the fast communication, reduced UDP-IP stack operates in parallel with the other communication stacks.

6. (Original) The system of claim 5, wherein the communication stacks are dedicated to specific classes of messages.

7. (Canceled).

8. (Currently Amended) The system of claim [[7]] 1, wherein a master device is communicatively coupled to the bus and the master device places the clock synchronization message on the bus.

9. (Original) The system of claim 4, wherein the fast communication, reduced UDP-IP stack is dedicated to a clock synchronization message class.

10. (Currently Amended) For an Ethernet industrial control system having a master device having master clock, an I/O module having a local device clock and a bus communicatively coupling the master device and the I/O module, wherein messages having varying levels of priority are placed on the bus by the master device, including a clock synchronization message for synchronizing the local device clock with the master clock, a method for quickly synchronizing the local device clock with the master clock, the method comprising:

generating a clock synchronization message, synchronized to the master clock;

tagging the clock synchronization message with a high priority identifier;

tagging other messages with a lesser priority identifier; and

placing the message[[s]] having the high priority identifier onto the bus before placing the messages with the lesser priority identifier onto the bus.

11. (Currently Amended) The method of claim 10, further using a first fast communication, reduced UDP-IP stack to place the message having the high priority identifier onto the bus before placing the messages with the lesser priority identifier onto the bus.

12. (Original) The method of claim 11, further dedicating the first fast communication, reduced UDP-IP stack for time critical flow.

13. (Original) The method of claim 12, further employing a second fast communication, reduced UDP-IP stack dedicated to I/O scan messages.

14. (Original) The method of claim 11, further employing a plurality of communication stacks for network message traffic of a plurality of priority levels.

15. (Original) The method of claim 11, further using a switch to retain network compatibility between tagged and untagged network devices.

16. (Original) The method of claim 11, further tagging network traffic with an IEEE 802 tag control information field inserted in a network frame header.

17. (Original) The method of claim 16, further using priority level tags ranging from 7 (highest priority) to 0 (lowest priority).

18. (Original) The method of claim 15, further adding VLAN information to untagged frames by assigning them a priority of 0 (the lowest priority) and removing VLAN information to frames addressed to untagged devices.

19. (Original) The method of claim 11, further using motion controls, drives and robots applications as the I/O modules requiring fast synchronization.

20. (Original) The method of claim 11, further coexisting applications requiring voice, message, or image transmissions on the same network.

21. (Original) An Ethernet industrial control system for transferring messages, wherein a message is tagged with identifiers of varying levels of priority, the system comprising:

a master device having means for generating a clock synchronization message;

an I/O module having a slave clock responsive to the clock synchronization message for synchronizing the slave clock with the master clock; and

a bus communicatively coupling the master device and the I/O module, wherein the master device includes means for tagging the clock synchronization message with a high priority identifier, means for tagging other messages with a lesser priority identifier, and means for placing the message having the high priority identifier onto the bus before placing a message with a lesser priority identifier onto the bus.

22. (Original) The system of claim 21, wherein a fast communication, reduced UDP-IP stack is dedicated for time-critical flow.

23. (Original) The system of claim 21, wherein there is network compatibility between tagged and untagged network devices.

24. (Original) The system of claim 21, wherein a tag control information field is inserted into network traffic in a network frame header to indicate traffic priority.

25. (Original) The system of claim 24, wherein the priority level tags range from 7 (highest priority) to 0 (lowest priority).

26. (Original) The system of claim 21, wherein a switch adds VLAN information to untagged messages by assigning them a priority of 0 (the lowest priority) and removes VLAN information to messages addressed to untagged devices.

27. (Original) The system of claim 21, wherein the message transfer has synchronous scheduling of network exchanges and code execution for consistent message on all network devices.

28. (Original) The system of claim 21, wherein an industrial control system has motion controls, drives and robots applications requiring fast synchronization.

29. (Original) The system in claim 28, wherein the industrial control system has electrical distribution applications requiring discrimination of events.

30. (Original) The system in claim 28, wherein the industrial control system transfers message automation applications with Ethernet management issues.